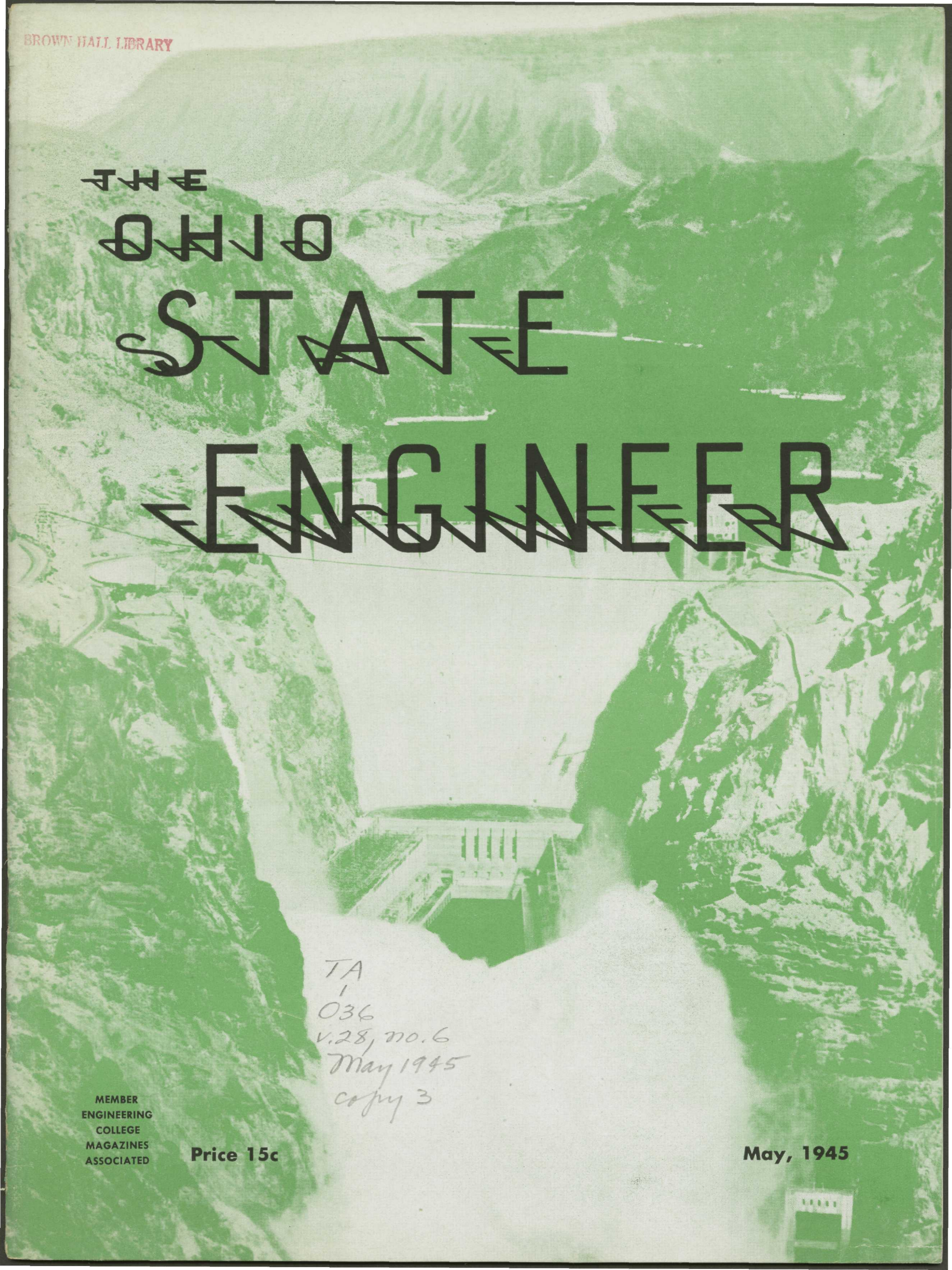
# THE OHIO STATE ENGINEER





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May, 1945

# FOR *Greater Success* IN ENGINEERING

## Learn to know your Bearings

A thorough knowledge of Timken Bearing design and application will be one of your best assets when you graduate to enter the professional engineering field. Begin to acquire it now. Here are the three most important features exemplified in the design of the Timken Bearing.

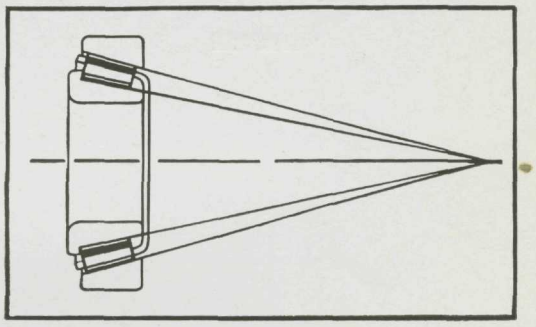


FIGURE 1

## 1. TRUE ROLLING MOTION

This basic necessity is assured by making all lines coincident with the tapered surfaces of the rollers, cup and cone, meet at a common apex on the axis of the bearing, Figure 1. True rolling motion always has been incorporated in the Timken Bearing.

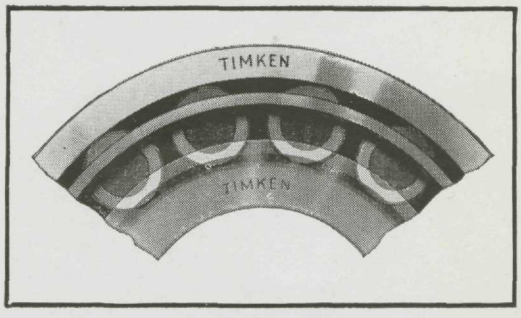



FIGURE 2

## 2. POSITIVE ROLLER ALIGNMENT

During the development of the Timken Bearing, as speed, load and accuracy requirements increased, various methods were used to stabilize the rollers and prevent them skewing in the raceways. The solution was found in establishing wide-area contact between the large ends of the rollers and the undercut rib of the cone, thus assuring constant and accurate roller alignment around the periphery of the raceways. The light areas on the ends of the rollers in Figure 2, show contact of rollers with undercut rib of cone.

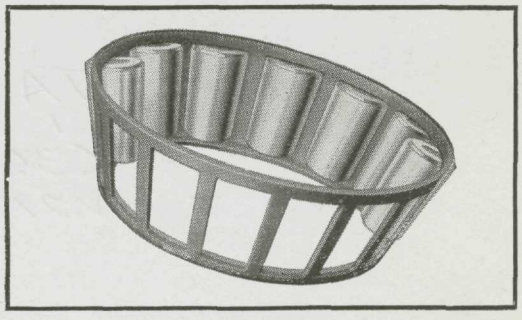


FIGURE 3

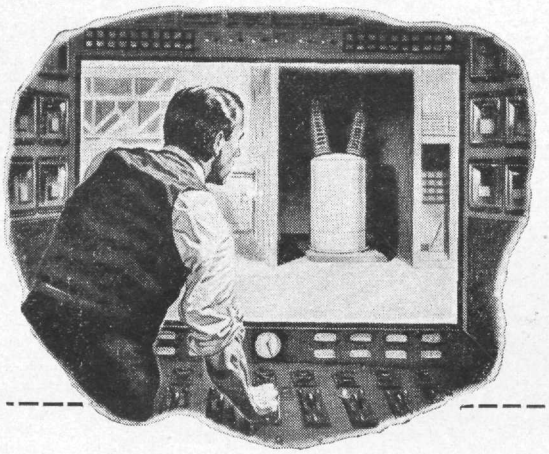
## 3. MULTIPLE PERFORATED CAGE

All the openings in the Timken Bearing cage, Figure 3, are stamped out in one operation by means of multiple perforating dies made to extremely close precision tolerances. This assures exact center-to-center spacing of the rollers around the periphery of the raceways, so that every roller takes its full share of the load when the bearing is in operation.

**THE TIMKEN ROLLER BEARING COMPANY, CANTON 6, OHIO**

In a field hospital, a SURGEON uses a new x-ray machine that marks the exact location of the bullet, speeds life-saving behind the battle line.

*. . . the name on the X-RAY MACHINE is Westinghouse.*



In a laboratory an ENGINEER uses the instantaneous power of 75,000 thunderbolts to test giant circuit breakers that protect America's power systems.

*. . . the name on the CIRCUIT BREAKER is Westinghouse.*

In his tent a SOLDIER uses a bug bomb to destroy insect life – safeguarding health and increasing comfort in tropical jungles.

*. . . the name on the BUG BOMB is Westinghouse.*

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*. . . the name on the ELECTROMAGNETIC DEVICE is Westinghouse.*

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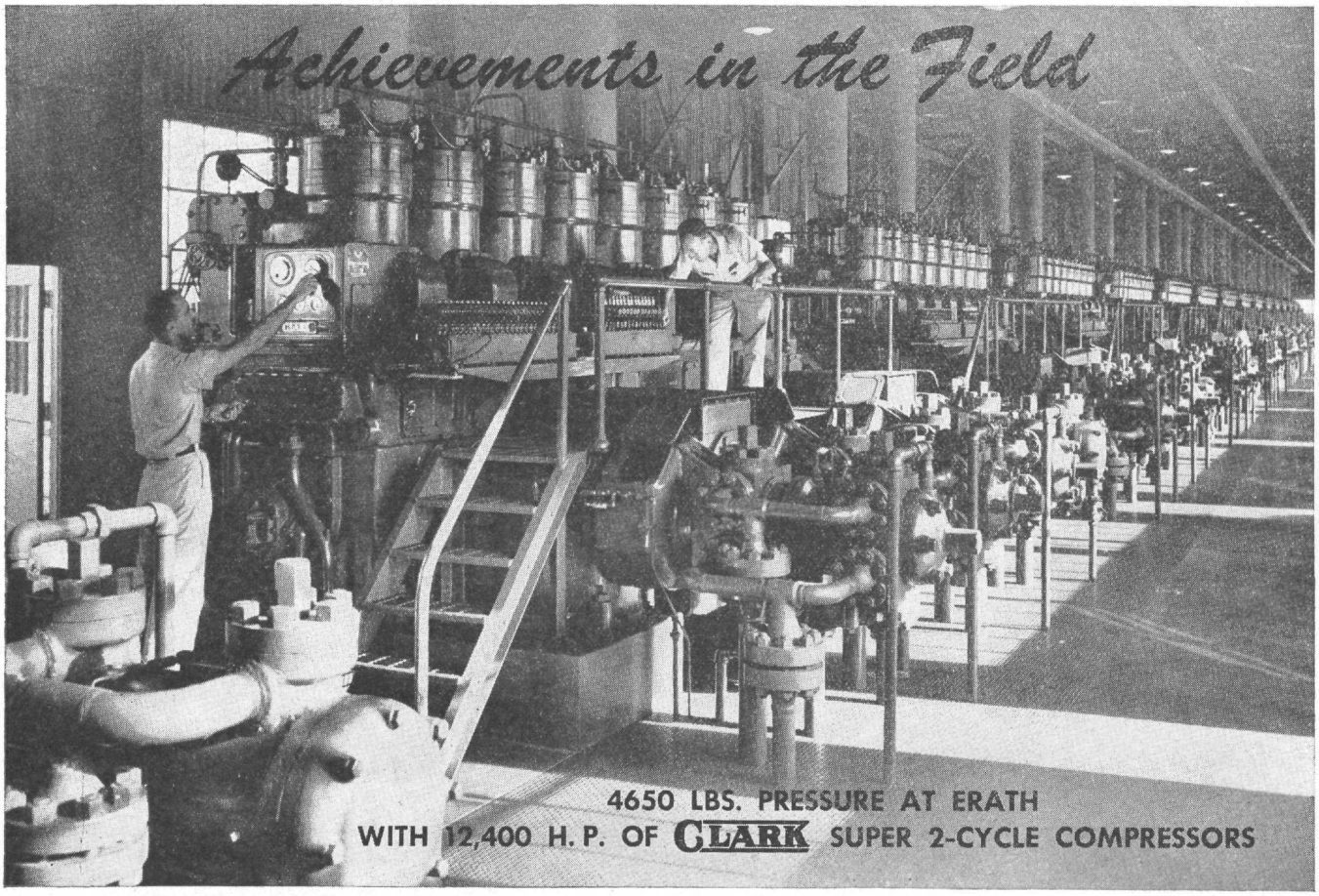


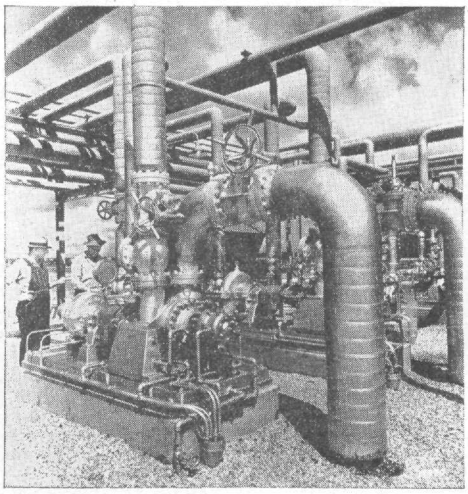

## More Gas to the Sand at Higher Pressure with 12,800 H. P. of Clark "Angles"

● The new recycling plant of the Texas Company at Erath, Louisiana, breaks all previous records by returning gas to the formation at 4650 lbs. pressure. The design and manufacture of the 16 Clark "Angle" Compressors for this job called for precision engineering and workmanship of the highest order. Compressor cylinders were designed to meet the exact operating conditions to which they would be subjected. Extremely close tolerances had to be maintained.

The basic economy and dependability of the Clark 2-Cycle "Angle" is demonstrated once more in the most modern type of plant.

INSTALLATION SHOWN AT THE RIGHT *is a battery of Pacific type H.V. Centrifugal pumps delivering peak efficiency in De Tentanizer furnace feed and lean oil service. Type H.V. handles extremely hot or sub zero liquids at low pressure. Speeds up to 3600 R. P. M. Capacities 100 to 3,000 G. P. M., and differential pressures up to 325 P. S. I. It is one of the many types of high precision pumps designed and built by Pacific.*

*In pump engineering, Pacific has always anticipated and met the requirements of industry with a long list of "Firsts" in design, and construction.*



*Two of the Dresser Industries*

**CLARK BROS. CO., INC.**
OLEAN, N. Y.

**PACIFIC PUMPS, INC.**
HUNTINGTON PARK, CALIF.

# The OHIO STATE ENGINEER

Vol. XXVIII MAY, 1945 No. 6

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### Our Cover

Boulder Dam, a giant power station. It will ultimately supply 1,317,500 kilowatts to the Southwest.

—*Courtesy General Electric.*

### Our Frontispiece

This is a roving power station, a 6250 kv-a., 80 per cent power factor train, which can serve in place of regular plants in case of emergency. It operates on poor grades of coal and can operate an entire day without water replenishment.

—*Courtesy Westinghouse.*

**ERNEST C. GRABILL, *Editor*** **ROSELLA HORINE, *Bus. Mgr.***

Published in the months of November, December, February, March, April, May and June by the students in the College of Engineering, The Ohio State University, Columbus, Ohio. Subscription price, 97 cents (tax 3 cents) per year for seven copies. Single copies, 15 cents each. Make checks and money orders payable to THE OHIO STATE ENGINEER.



Entered as second-class matter May 15, 1912, at the post office at Columbus, Ohio, under the Act of March 3, 1879. Acceptance for mailing at special rate postage provided for in Section 1103, Act of October 3, 1917. Authorized December 8, 1922

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